

REMARKS

Amendment to the Claims

Claim 1 is amended to recite the structurally joined heat exchanger includes inner and outer walls between which a continuous axially extending corrugated heat conductive fin is contained, thereby creating an array of axially extending reformat passages and coextensive nested ambient air passages arrayed in mutually heat conductive fashion. The disclosure for the amended language can be at least found in original claim 2, now cancelled, and in lines 9-16, on page 5, of the application.

The dependency of claim 3 is amended following the cancellation of intervening claim 2.

It is believed that the amendments herein fully address the concerns raised in the Office Action and place the claims in condition for allowance. In the event that, for some reason, the claims are still deemed not to be allowable, it is nevertheless requested that the amendments be entered, if only for purposes of clarifying issues on appeal.

Claim Rejection under 35 USC § 103

Claims 1-4 have been rejected under 35 USC 103(a) as being unpatentable over Pettit (US 2004/0047777) in view of Valensa (US7069981).

Applicants' invention provides for a combination hydrogen reformer and structurally joined heat exchanger, which is substantially cylindrical and coaxially integral with the reformer as shown in Figs. 1 and 3 of the application. The structurally joined heat exchanger includes an inner and outer wall between which contains a continuous axially extending corrugated heat conductive fin. The extending corrugated heat conductive fin creates an array of axially

extending reformat passages and coextensive nested ambient air passages. Oxygenated ambient air enters the ambient air passages in one axial direction and into the reaction chamber to create hydrogen reformat, while the reformat concurrently moves axially in the opposite direction out of the reaction chamber and through the heat exchanger reformat passages, in continuous heat exchanging relationship with the oppositely flowing ambient air over substantially the entire axial length of the heat exchanger. An advantage to Applicants' invention is that the ambient air is continually warmed before reaching the reaction chamber, and the reformat is continually cooled before exiting the heat exchanger.

As acknowledged by Examiner, Pettit '777 does not disclose a heat exchanger that is substantially cylindrical or substantially coaxial to the reformer and structurally joined therewith. While Valensa '081 discloses a heat exchanger having coaxial cylindrical walls integrated with a reformer, neither Pettie '777 nor Valensa '081, separately or in combination, suggests or teaches a reformer that includes a structurally integrated heat exchanger, where the heat exchanger includes an inner and outer wall between which is contained a continuous axially extending corrugated heat conductive fin, which creates an array of axially extending reformat passages and coextensive nested ambient air passages. Furthermore, Valensa '081 teaches away from Applicants' invention by disclosing a circumferential array of heat exchange tubes 100 having interiors 102 for receiving a first fluid 52 and exteriors 104 over which the second fluid 54 is directed (column 8, lines 56-62). The radial tube arrangement creates a cross/counterflow and a cross/parallel flow arrangement through the heat exchanger. In contrast, Applicants' invention is a pure counter-flow device where ambient air entering the air passages moves in one axial direction and concurrently, the hydrogen reformat moves axially in the opposite direction in a continuous heat exchanging relationship.

In accordance with Applicants' invention, claim 1 recites a substantially cylindrical heat exchanger substantially coaxial to the reformer, adjacent at one end to the reformer and structurally joined therewith, the heat exchanger has inner and outer walls between which a continuous axially extending corrugated heat conductive fin is contained, thereby creating an array of axially extending reformat passages and coextensive, nested ambient air passages arrayed in mutually heat conductive fashion.

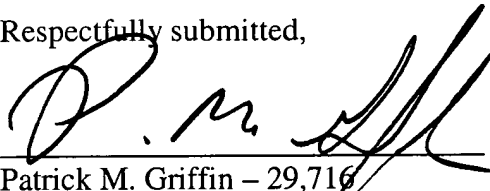
Claim 1 is patentably distinguishable over Pettit '777 in view of Valensa '081, and claims 3-4 ultimately depend upon claim 1. Applicants respectfully request the reconsideration and withdrawal of the rejection for claims 1, 3, and 4, and that the claims be allowed.

Conclusion

It is believed, in view of the amendments and remarks herein, that all grounds of objection and rejection of the claims have been addressed and overcome, and that all claims are in condition for allowance. If it would further prosecution of the application, the Examiner is urged to contact the undersigned at the phone number provided.

The Commissioner is hereby authorized to charge any fees associated with this communication to Deposit Account No. 50-0831.

Respectfully submitted,



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